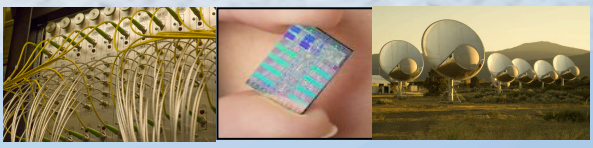
Information Science and Technology

A key challenge in IS&T is extraction of information from massive streams of data that are arriving in real time.

LANL has developed cutting-edge streaming data capabilities, including real-time processing and pipelining, and methods for the analysis, visualization, and storage of massive streaming data. These capabilities will enable LANL to respond to key challenges of national interest, including **cybersecurity, threat reduction**, data from **sensor networks**, **systems data** (biological or otherwise)– in which a vector of data is recorded at every time step, **non-proliferation, situational awareness** programs, including space, weather, and infrastructure, e**nergy security**, and **biosecurity**.



- Methods for using emerging microparallelism, e.g. Cell processors and GPUs, for real-time and near-real-time pipelining and processing
- Statistical and signal processing methods for real-time or near-real-time baselining, anomaly detection, and signal detection of high-dimensional data
- Novel file system architectures for real-time data ingest and writing out of data identified to be of interest

Challenges:

- Shear **amount** and **intricacy** of the data streams and the **complexity of the algorithms** required for processing
- **Fusion** of streams for **enhanced data-to-knowledge** capability

Andy DuBois, ajd@lanl.gov and phone

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NNSA National Nuclear Security Administration